

**MARKET SURVEY - REQUEST FOR INFORMATION (RFI)**  
**HR 5900 SECTION 214**  
**FLIGHT OPERATIONAL QUALITY ASSURANCE (FOQA)**  
**DEMONSTRATION PROJECT FOR**  
**PART 121 AIRLINES WITH SMALL FLEETS**

**1. Introduction**

This is a Request for Information (RFI) only and does not constitute a commitment, implied or otherwise, that the Federal Aviation Administration (FAA) will take procurement action in this matter. Further, neither the FAA nor the Government will be responsible for any cost incurred in furnishing this information.

This RFI will be used to gather market research information and ideas for the FAA to make decisions regarding a FOQA demonstration project for Part 121 airlines with small fleets as described below. The FAA is seeking information and ideas from contractors, educational institutions, and/or other appropriate organizations about the community's ability to satisfy the requirements given below and/or provide ideas on alternate means of achieving similar goals. The FAA is looking for knowledgeable information concerning the available types of equipment on the market and associated costs, personnel requirements and costs and other information associated with performing such a demonstration project.

The goal of this RFI is to help the FAA and the government to determine the best course of action, most cost effective equipment available, personnel requirements, other related requirements, and all costs associated with performing such a demonstration project. The goal of the demonstration project is to comprehensively assess the cost-benefit and safety enhancement effectiveness of FOQA programs in which small fleet airlines utilize in-flight recorded data to routinely monitor their flight operations. The following plan laid out in a statement of work format outlines one possible course of action that the FAA may take in order to obtain the required data needed to respond to HR 5900. The FAA is asking for information regarding available equipment and costs, and personnel and costs. The FAA would also like alternative ideas (if available) and costs associated with those ideas.

**2. Background**

The Airline Safety and Federal Aviation Extension Act of 2010, H.R. 5900 tasked the Federal Aviation Administration (FAA) with a number of initiatives related to aviation modernization and safety enhancement. Part of this act refers to Voluntary Safety Programs and in particular, for the purposes of this RFI, the Flight Operational Quality Assurance (FOQA) program.

FOQA is currently a voluntary safety program in the US designed to make commercial aviation safer by routine collection and analysis of digital flight data from air carrier operations, and by acting on that information when warranted, in the interest of safety. General guidance on the development and implementation of an airline FOQA program, including the standard components thereof, is provided in FAA Advisory Circular 120-82, Flight Operational Quality Assurance.

While no operator is currently required to obtain FAA approval of its FOQA program, operators seeking the protection of 14 CFR Part 13.401 from the use of FOQA information for enforcement must obtain FAA approval of their programs. The process for doing so is described in AC 120-82 and FAA Order 8900.1, Volume 11, Chapter 2, Section 2. To obtain approval, the operator must submit and maintain a FOQA Implementation and Operations (I&O) Plan. AFS-230 is responsible for managing the review, coordination, and approval process for all FOQA I&O Plans, for maintaining a current archive of approved I&O Plans, for maintaining a data base of quarterly safety enhancement reports that are required by FAA Order 8900.1 to be submitted to AFS-230 by Certificate Holding District Offices (CHDOs), for participating in periodic meetings at a national level at which operators brief safety issues and trends revealed by analysis of their FOQA data, for representing the FAA in interfacing with industry as needed with respect to communicating FAA policy on the approval and monitoring of individual operator FOQA programs.

The following is an extract from the Airline Safety and Federal Aviation Extension Act of 2010, H.R. 5900, Section 214:

#### SEC. 214. ASAP AND FOQA IMPLEMENTATION PLAN.

(a) Development and Implementation Plan- The Administrator of the Federal Aviation Administration shall develop and implement a plan to facilitate the establishment of an aviation safety action program and a flight operational quality assurance program by all part 121 air carriers.

(b) Matters To Be Considered- In developing the plan under subsection (a), the Administrator shall consider--

(1) how the Administration can assist part 121 air carriers with smaller fleet sizes to derive a benefit from establishing a flight operational quality assurance program;

(2) how part 121 air carriers with established aviation safety action and flight operational quality assurance programs can quickly begin to report data into the aviation safety information analysis sharing database; and

(3) how part 121 air carriers and aviation safety inspectors can better utilize data from such database as accident and incident prevention tools.

(c) Report- Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a copy of the plan developed under subsection (a) and an explanation of how the Administration will implement the plan.

(d) Deadline for Beginning Implementation of Plan- Not later than one year after the date of enactment of this Act, the Administrator shall begin implementation of the plan developed under subsection (a).

--- End Extract.

This RFI presents the basic requirements of a FOQA demonstration project for part 121 airlines with small fleets as part of the FAA response to HR 5900 section 214. For the purpose of this FOQA demonstration project, the number of airlines to be included shall be six representative part 121 operators, and the term "small fleet" shall be considered to mean 15 or less aircraft.

These requirements are part of the FAA's plan to help facilitate the establishment of FOQA programs by all part 121 air carriers; this plan will provide needed information to encourage participation in FOQA and will supplement other encouragement efforts being undertaken by the FAA.

### **3. Demonstration Project Objective**

The primary purpose of this demonstration project to determine the feasibility of implementing FOQA for part 121 air carriers with small fleets. A secondary purpose is to provide the FAA with information that will aid the FAA in determining how it can best assist all such operators in establishing such programs.

### **4. Demonstration Project Work Summary**

Modern part 121 aircraft are configured with Digital Flight Data Acquisition Units (DFDAUs) that can readily accommodate airborne recording equipment required for FOQA monitoring. The task of the demonstrator is to select a representative subsample of six small fleet part 121 airlines and develop an operational FOQA program for those airlines.

The demonstrator will work with the airlines to select the best solution for each, while striving to achieve costs that are reasonably affordable for a small fleet airline. The solutions provided will be an all-inclusive, spanning the continuum for aircraft data collection and continuing through data integration, analysis, flight review, flight anomaly identification and data sharing. Consideration of the airline culture and employee or labor union relations should also be taken into account in the development of proposed solutions. Since smaller airlines are likely to have limited resources, knowledge about the FOQA programs being developed by the major carriers can be analyzed to encapsulate stream-lined operating and implementation procedures. Resource requirements for smaller operations can be inferred from this experience and transformed into guidelines, milestones, and timetables tailored for the needs of smaller operators.

Success will not depend on solely placing equipment and software within an airline. It will depend on whether a fully functioning FOQA safety system and culture can be established where information is produced and used for the betterment of airline safety and as an integral part of a Safety Management System (SMS). Status reports will be generated along the way detailing trials and tribulations and all documentation will detail all successful processes, management practices, success factors, best practices, mistakes, costs and all other items of importance associated with the establishment of the system. The demonstrator must not only be knowledgeable of all aspects of FOQA but of airline management and labor relations.

### **5. Demonstration Project Work Tasks**

The demonstrator will evaluate the state-of-the-art in FOQA technology for applicability to small fleet airlines, work with six airlines over a three year period of time, acquire the necessary equipment and resources to enable digital flight data monitoring of aircraft operations for at least 2 years of that period, and monitor the effectiveness of the resulting program, to include cost-benefits and problem areas. In addition to evaluating both off-the-shelf and emerging technologies, this demonstration project shall investigate the associated organizational and cultural issues related to implementation and industry acceptance of such a program, including consideration of management and flight crew support, privacy and security provisions, resource requirements, benefits, and potential cost savings. This demonstration project shall consist of the following four tasks that are described in subsequent sections:

1. Establishment of a Project Plan
2. Establishment of airline partnerships.
3. Acquisition of FOQA Program Resources.
4. Monitoring participating airline FOQA programs.

## 5. Generation of final report, recommendations, and guidelines.

The expected period of performance for accomplishment of all tasks will be 48 months from contract award. The following section describes the tasks to be accomplished in this demonstration project.

### **5.1 - Task 1 - Establishment of a Project Plan**

The first task shall entail the development of a detailed project plan that includes specific milestones with dates. The plan shall contain the demonstrator's assessment of the current state-of-the-art in FOQA data acquisition and analysis technology as it may apply to this project, a description of alternative approaches warranting consideration for this project, an analysis of the trade-offs between those alternative approaches, and a recommended acquisition and implementation strategy entailing one or more of the applicable alternative approaches considered by the demonstrator to be the most feasible. The demonstrator shall include as part of its analysis an assessment of the aircraft currently in the inventory of small fleet airlines in terms of the FOQA-readiness of such aircraft, including a determination on an aircraft make/model/series specific basis whether digital flight data may be routinely downloaded from the on-board digital flight data recorder required by regulation. The demonstrator shall consider the availability of alternative vendor services for the analysis of digital flight data.

### **5.2 - Task 2 - Establishment of Airline Partnerships**

The second task involves establishing partnerships with six interested airlines. The demonstrator shall issue a public announcement soliciting the participation of small fleet airlines in this project. The criteria for selecting a candidate airline shall be determined, including financial stability, management commitment, resource commitment (dollars, personnel, facilities, etc.), fleet characteristics, fleet size, and aircraft availability. The demonstrator shall develop non-disclosure and cooperation agreements that clearly delineate the contributions and responsibilities (both short-term and long-term) of each party; specifies management, legal, and regulatory issues; defines data control and security provisions; and other appropriate concerns. These non-disclosure and cooperation agreements shall be provided to each candidate airline as part of the initial discussions. The agreements between candidate airlines and their applicable pilot associations shall be reviewed to ensure that appropriate provisions are in-place for participation in a FOQA program and collecting flight data recorder data.

In order to collect meaningful knowledge about the demonstration project, the airline shall need to make a commitment to record and process FOQA data for aircraft identified for participation in this study, as well as allow interviews by the demonstrator of involved airline personnel during the effort. Additionally, information specific to study purposes will need to be accessible. Such information would be generic and would not be used to identify specific pilots, flights, airlines, etc. This information would include procedures and practices developed during the course of the demonstration project and their perceived benefits and weaknesses. Statistics about items such as the number of monitored flights, number and type of exceedences, number of false positives, trends, problems, adjustments, etc. that would be pertinent to this project. The demonstrator shall work with the airlines and the FAA to determine what information is meaningful for demonstration project monitoring as part of Task 3.

An inventory of the interested part 121 airline fleets shall be developed by the demonstrator to document FOQA compatibility of those fleets. Up to twelve part 121 small fleet airlines that express interest in participation shall be identified and ranked for project suitability by the demonstrator, from which six such airlines shall be selected for this project by the FAA.

The demonstrator shall develop a FOQA Implementation & Operations (I&O) Plan for each such selected operator in accordance with the provisions of AC120-82. Selected operators shall be required to submit those plans to the FAA for approval. Airlines with FAA approved I&O plans shall be accorded the full protections specified in 14 CFR part 13.401 against use of that information for enforcement purposes against an airman or the airline.. In addition, any FOQA information provided to the FAA in conjunction with this project shall be accorded the FOIA and public release protections specified in FAA Order 8000.81.

Small fleet air carriers may vary widely in their readiness to begin a FOQA program. The demonstrator shall contact candidate airlines for detailed discussions about issues pertinent to this demonstration project, such as:

- Existing aircraft capabilities including the number and type of aircraft from which digital flight data may be readily downloaded from the existing mandatory DFDR, as well as any such aircraft that are either already Quick Access Recorder (QAR) equipped or can readily accept installation of such equipment.
- Airline agreement to pay for all costs associated with the installation, training, and maintenance for FAA provided equipment.
- Existing FOQA programs including equipment, fleets, status, resources, limitations, and data usage.
- Financial commitments by the airline for cost-sharing of equipment acquisition.
- Existing or planned company agreements between airline management and pilots addressing mutual concerns with respect to individual protection, privacy, data use, data access, data protection, and data retention.
- Airline agreement to provide staffing and associated logistical resources required to retrieve data disks from aircraft, transfer data to ground analysis stations, operate ground analysis stations, interpret data analysis results, detect and understand trends, etc..
- Existing or planned airline procedures for the use of FOQA information to achieve safety enhancement.
- FAA and airline responsibilities regarding this demonstration project.
- Identification of what types of agreements are required to enable the demonstrator to observe and collect information related to airline execution of its FOQA program during the demonstration project.
- Airline agreement to acquire FOQA data from aircraft equipped with FAA furnished equipment.
- Availability and/or development of a FOQA Implementation and Operation plan to submitted to the FAA for review and approval.
- Designation of a point-of-contact for coordination with demonstrator.

Small fleet air carriers may vary widely in their readiness to begin a FOQA program. At the conclusion of this task, the participating airline and their specific equipment needs shall have been identified, and formal agreements shall have been developed.

### **5.3 - Task 3 - Acquisition of FOQA Program Resources**

The demonstrator shall make recommendations as to which FOQA hardware, software, and/or vendor services should be procured to support the goals of this demonstration project for a given selected airline. These recommendations shall be based upon (1) an evaluation of the stated needs, goals, and idiosyncrasies of participating airlines and (2) the need for this demonstration project to include a representative cross-section of available off-the-shelf technologies. The evaluation shall consider such factors as functional capabilities, data transfer capabilities, security features, equipment availability, performance capabilities, software platform, user accessibility, software capabilities, resource requirements, user airline customization capabilities, acquisition

and on-going costs, user support, usability, vendor support, training requirements, validation, robustness, and quality of documentation. Recommended delivery and training schedules shall also be established.

The demonstrator's recommendations shall be reviewed by the FAA and participating airlines. Individual airline written statements of concurrence/non-concurrence with respect to airline responsibilities for the installation, training, utilization, maintenance, and disposition of equipment, as well for participation in this demonstration project, shall be obtained by the demonstrator and forwarded to the FAA. Formal written approval from the FAA COTR and Contracting Officer shall be obtained prior to any equipment hardware or software procurement by the demonstrator. Equipment shall be procured for delivery directly to the participating air carrier. Participating airlines are responsible for all costs associated with any Supplemental Type Certification (STC), equipment installation, training, utilization, and maintenance that may be required.

#### **5.4 - Task 4 - Monitoring Airline FOQA Demonstration project Programs**

This task involves documenting the utilization of the installed components for flight operations monitoring and data analysis by the airline in their operational environment. A structured framework for this Demonstration project shall be defined both for the usage of the equipment by the airline for flight monitoring and to collect desired information related to the overall evaluation. Formal approval of this framework shall be obtained from all respective parties.

The demonstrator shall work with the airline to document procedures employed by the airline for:

- Identification of data retrieval methods and/or transmission, frequency of data removal, location of removal, transport logistics to ground station (i.e., ground transportation, company mail, express mail, high-speed data transmission, etc.), spares support, and other handling activities.
- Data protection and security provisions.
- Data retention practices for both individual flights and trended data.
- Pilot notification procedures.
- Development of routine operational events, event definitions and parameter thresholds
- Interpretation of FOQA event data
- Developing optimal reports for the particular operations and concerns of the specific airline.

Procedures to facilitate effective communication between airlines, the FAA, and the demonstrator shall be established early in the demonstration project including phone, email, internet, and on-site visits. The demonstrator shall identify the most appropriate methods for collecting and representing information related to the following types of issues:

- Identification of limitations of current systems and the nature of any workarounds, particularly in the area of the incidence of false positives and adjustment event thresholds.
- The nature and effectiveness of the airlines organizational solutions, approaches, and methods for collecting, handling, disseminating, and processing the information being collected.
- Analysis of the methods developed by the airline to understand events and discovery of trends, based as much as possible on off-the-shelf software, and determine their suitability for better identifying and presenting trend information.

- Investigation of the methods used to automatically discover trends, determine their suitability for identifying and presenting trend information, and exploring what additional capabilities are needed. Features to be examined include: access flexibility, handling of data anomalies, usefulness, clarity, interpretability, skills, etc.
- Examination of how information is structured to optimize utilization of data without violating privacy and security provisions.
- Investigation of how the airlines measure the value of consistent and timely information about various aspects of their operations and determination of the perceived business benefits.
- Determination of the appropriate people to understand and act on the data, and in what formats they require the information.

The demonstrator shall hold quarterly meetings, including the FAA and participating airlines, to discuss current status of each airline FOQA program, lessons learned, shortcomings and benefits of various approaches for detecting, processing, and analyzing events, trend analyses, etc.

## **5.5 - Task 5 - Generate Final Report and Recommendations**

This task shall provide an overall description of the effort and the insights gained from the use of flight data including effectiveness, costs, and benefits. Technical issues to be addressed shall include not only a determination as to whether the system functionality was adequate, but also how well the airline was able to interact with the system to gain insights on what the data revealed and what corrective actions were accomplished by airlines based on FOQA data. Included in the documentation shall be information related to:

- Identification of the best features of the system along with what is required to mitigate their shortcomings for use in a dynamic and complex real-world air carrier operation arena.
- Details on how provisions for data privacy and security, etc. were met.
- Specific information on costs, including the initial implementation and installation, certification, annual recurring operating costs, and staffing resources.
- Information about how the system was configured by the participating airline.
- Descriptions of procedures developed by the airline for getting data from aircraft to ground station; detecting and understanding events and trends; and handling of data, including shortcomings and areas for improvement.
- Documentation of formats employed for statistical summaries of collected information such as flights monitored, events detected, incidence of false positives and steps taken to adjust, trends identified, corrective actions taken, etc. (subject to concurrence by participating airline)
- Suitability of the analysis systems employed by the airline for exceedance extraction and trend identification.
- Extrapolation of resources/benefits to implement airline-wide on a larger scale.
- Document effectiveness of various organizational solutions as to how data was handled.
- Recommendations for future refinements needed to improve the effectiveness of existing off-the-shelf components.
- Evaluation of the ability of FOQA programs and current software to allow airline to more quickly and accurately identify and track problems.
- Investigation of the methods used by the airline to quantify improvements in safety, operations, and training.

- Staffing requirements and identification of which labor-intensive efforts were automated by the airline and which tasks can be possibly further automated to achieve the maximum cost savings.
- Guidelines for effective data exchange including appropriate measures for data security and safeguards.
- Documentation of the use of FOQA information for safety enhancement, and empirical information on its cost-benefits and return on investment.

The demonstrator shall make the collected information available throughout the demonstration project as various phases are completed.

## **6. Demonstration Project Management**

### Project Plan

A detailed project plan shall be developed in accordance with the description of Task 1 above. Before any work can begin the plan must be approved by the FAA COTR. Updates to this plan will be part of the monthly progress report and reflect the current status of the project.

### Monthly Progress Reports

Monthly Status Reports will be provided on a monthly basis reviewing both what has occurred over the past month and what is planned over the next month. The project plan will be updated to reflect project status. Any new work added to the project plan must be approved by the FAA before start.

### Periodic Project Reviews

Interim project reviews shall be planned to provide a mechanism for establishing progress-to-date, reviewing the financial status, and discussing plans for the next quarter. Reviews shall usually be conducted either in demonstrator location or Washington, DC. Other locations shall be considered as required. These quarterly reviews shall be held as close to the beginning of the calendar month as practical, beginning with a kick-off meeting. Exact meeting dates shall be influenced by individual constraints pertaining to the time frames of the meetings. Scheduling for each meeting shall be established several weeks prior to the meeting and shall be approved by the FAA.

### Quarterly Airline Reviews

Once the airborne and ground-based equipment is installed by the participating airline, quarterly meetings shall be held with each airline to review progress-to-date, lessons learned, successes, problems, and solutions.

### Site Visits

Periodic site visits, subject to FAA prior approval, shall be made to the participating airline sites for the purpose of observing their usage of the equipment, conducting interviews to elicit feedback about the efficacy of the system, collecting appropriate statistics, assisting in the effective utilization of the systems, and interacting with involved airline personnel.

## **7. Demonstrator Personnel Requirements**

It's estimated that the following personnel may be required: Project Manager, Project Leader, Principal Scientist, Analyst, Engineer, and Technical Writer.

## **8. Demonstration Project Period of Performance**

The estimated total period of performance for this demonstration project is 48 months months.

## **9. Demonstration Project Deliverables**

The demonstration project deliverables, as shown in Table 1a and 1b, would include the following items:

1. Project Plan
2. Equipment Overview Report
3. Monthly Hardware and Software Inventory of Items Purchased under the Contract
4. Monthly Progress Reports
5. Quarterly Project Meeting Minutes and Recommendations
6. Quarterly Airline Meeting Minutes and Recommendations
7. On-Site Visits Minutes and Recommendations
8. Cost Benefit Analysis
9. Data Management Plan
10. Final Report

## **10. Request for Information (RFI) Deliverables**

1. Equipment and/or vendor services available to complete the above demonstration project.
2. Cost of equipment and/or vendor services to complete the above demonstration project.
3. Recommendations for equipment and/or vendor services best suited to meet the needs of the above demonstration project.
4. Reasons why the equipment and/or vendor services were recommended.
5. Estimations for personnel and associated labor categories, educational requirements, and experience requirements required to complete the above demonstration project.
6. Reasons why those personnel are required.
7. Estimated costs associated with those personnel.
8. Estimated time period of the above demonstration project and all costs associated with completion of such a project.
9. Detailed description of suggested alternative means of satisfying the objectives set for this demonstration project.
10. Any other information considered by responders to be relevant.